Contents

I. About AIBLab

AI platform-based application solution and services provider

AIB Services

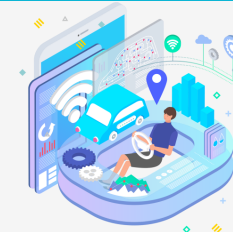| AIBworks | AIBFactory | AIBCity | Connected Car |

AIB Platform

AIB AI Platform

AIB IoT Platform   oneM2M   GOOD Software

An artificial intelligence company founded in December 2018

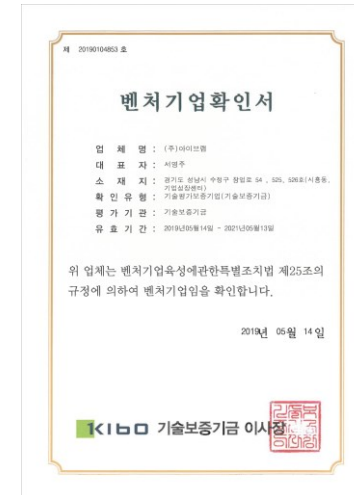**CEO** | Youngju Seo, Yongwoo Kim

Employee | 25 persons

Established | December 2018

Location | 525-ho, 54, Changeop-ro, Sujeong-gu, Seongnam-si, Gyeonggi-do, Republic of Korea
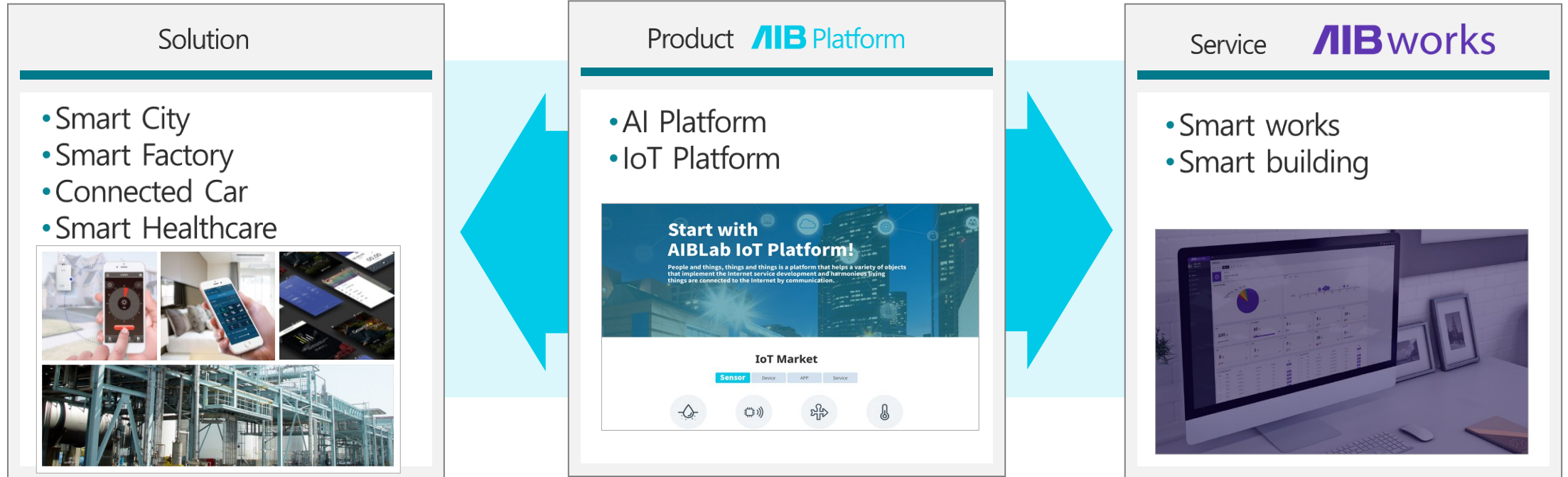
Customer

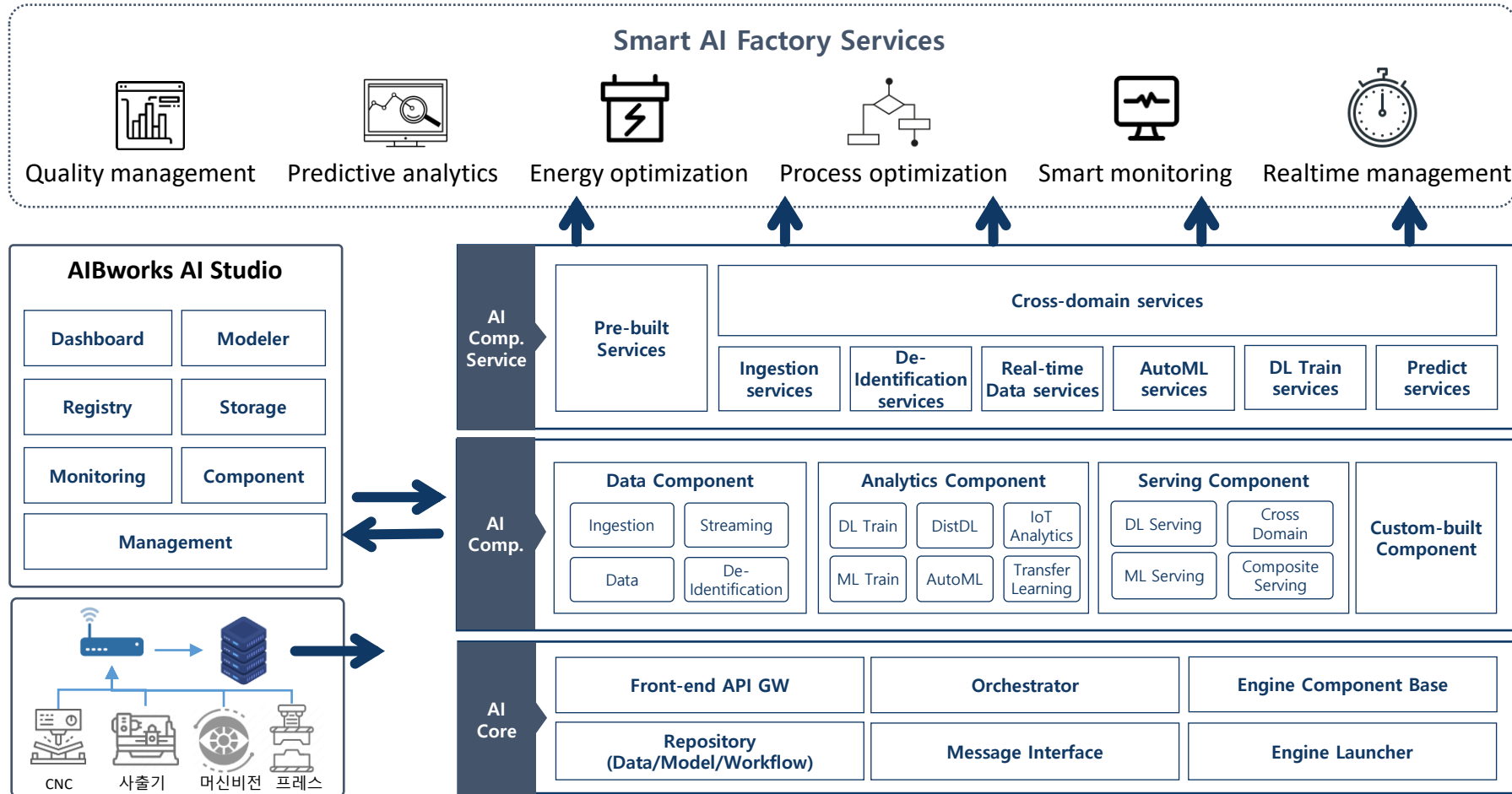**Partners**

Venture business confirmation

Company-affiliated research institute certificate

Performing various businesses such as artificial intelligence and IoT platform-based
smart factory, smart city, and smart office

Solution

- Smart City
- Smart Factory
- Connected Car
- Smart Healthcare

Product **AIB** Platform

- AI Platform
- IoT Platform

Start with AIBLab IoT Platform!

People and things, things and things is a platform that helps a variety of objects that implement the Internet service development and harmonious living things are connected to the Internet by communication.

IoT Market

| Sensor | Device | APP | Service |

Service **AIB** works

- Smart works
- Smart building

AIBworks AI platform that combines IoT, big data, machine learning and domain knowledge

Smart AI Factory Services

Quality management   Predictive analytics   Energy optimization   Process optimization   Smart monitoring   Realtime management

AIBworks AI Studio

Dashboard	Modeler
Registry	Storage
Monitoring	Component
Management	

CNC   사출기   머신비전   프레스

AI Comp. Service

Pre-built Services

Cross-domain services

Ingestion services	De-Identification services	Real-time Data services	AutoML services	DL Train services	Predict services

AI Comp.

Data Component

Ingestion	Streaming
Data	De-Identification

Analytics Component

DL Train	DistDL	IoT Analytics
ML Train	AutoML	Transfer Learning

Serving Component

DL Serving	Cross Domain
ML Serving	Composite Serving

Custom-built Component

AI Core

Front-end API GW	Orchestrator	Engine Component Base
Repository (Data/Model/Workflow)	Message Interface	Engine Launcher

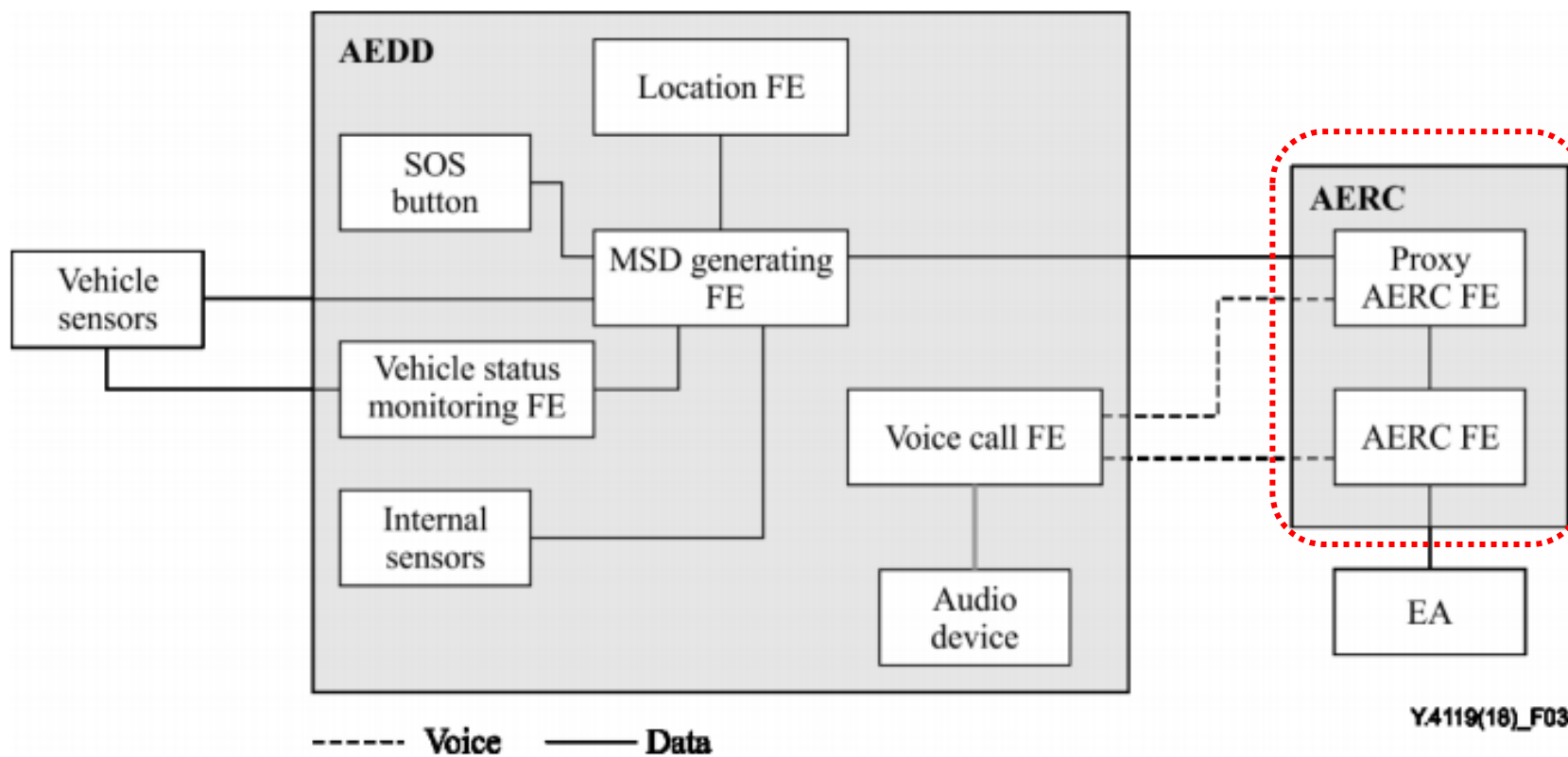## Collecting/storing a large amount of data using IoT platform, Provide artificial intelligence-based learning/prediction service

Sensing / Device Data
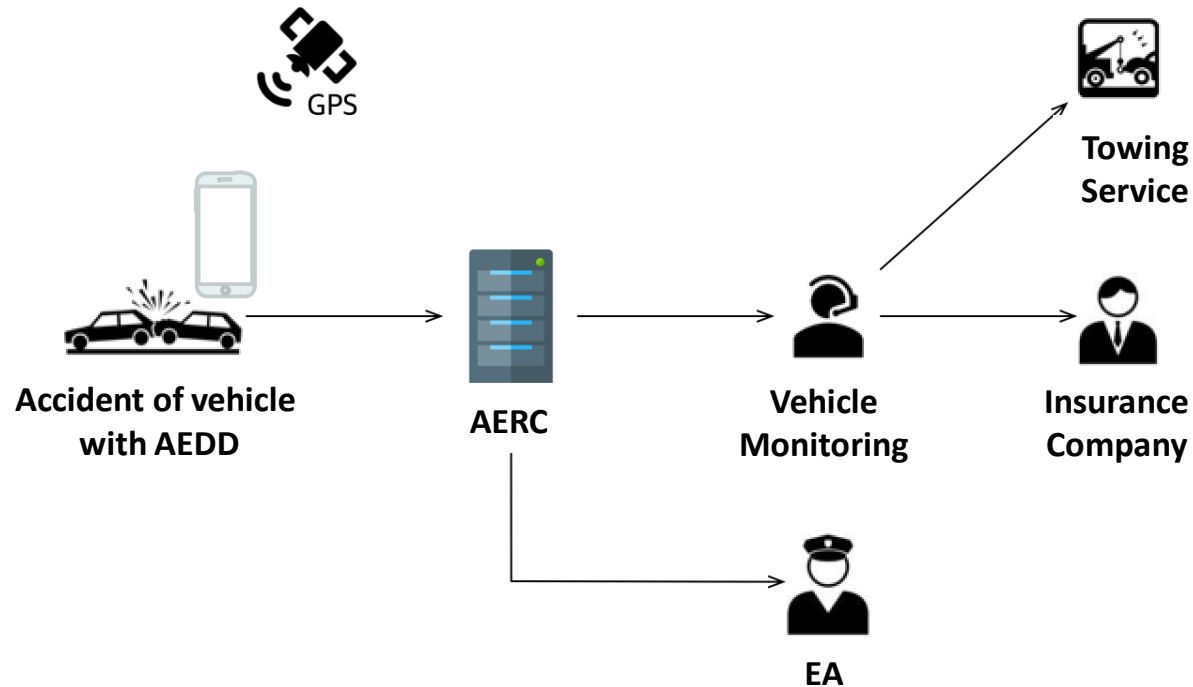
Access and attendance management

Toilet use

Public open data **Legacy data**

Collect/Store

AIBworks Service

Smart 근태	Smart 환경	Smart Toilet
근태 예측/분석	환경 모니터링	사용량 분석

지식 서빙	개인화 알림

인공지능/ML/DL 엔진

학습/예측

원본데이터　데이터처리　비식별 처리

데이터 수집/저장

센서/디바이스 관리

AWS/Azure/Google/NHN IaaS

Learning/Prediction

AI Application Service

- A guide for predicting attendance in connection with attendance history and public data
- Overtime forecast of 52 hours per week through analysis of working hours
- Classification of work types according to work patterns
- Efficient management service through forecasting working hours

PC/Web　　　　Mobile

II. AERC Implementation

Capability Framework of the IoT based Automotive Emergency Response System(AERS)

Y.4119(18)_F03

Automotive Emergency Response System Overview

Features

- Solutions capable of testing with terminals for AERS standard-based test items(TTA)
- Supports communication with terminals according to CoAP, the communication method defined in MSD protocol
- Connection with the callback system, accident handling through ARS conversion and connection to a counselor
- Possible to link with external control system according to Proxy PSAP application
- Establishment of TTA AERS interoperability test solution

AIBLab

Automotive Emergency Response System Flows
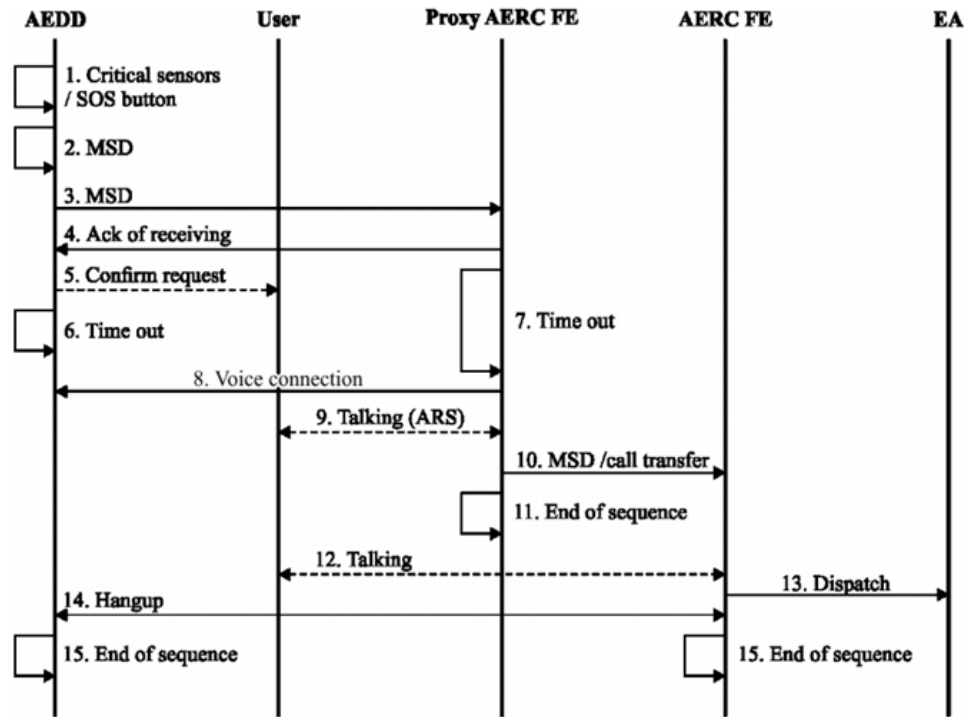
Figure 4 – AERS workflow in case of EA dispatch request
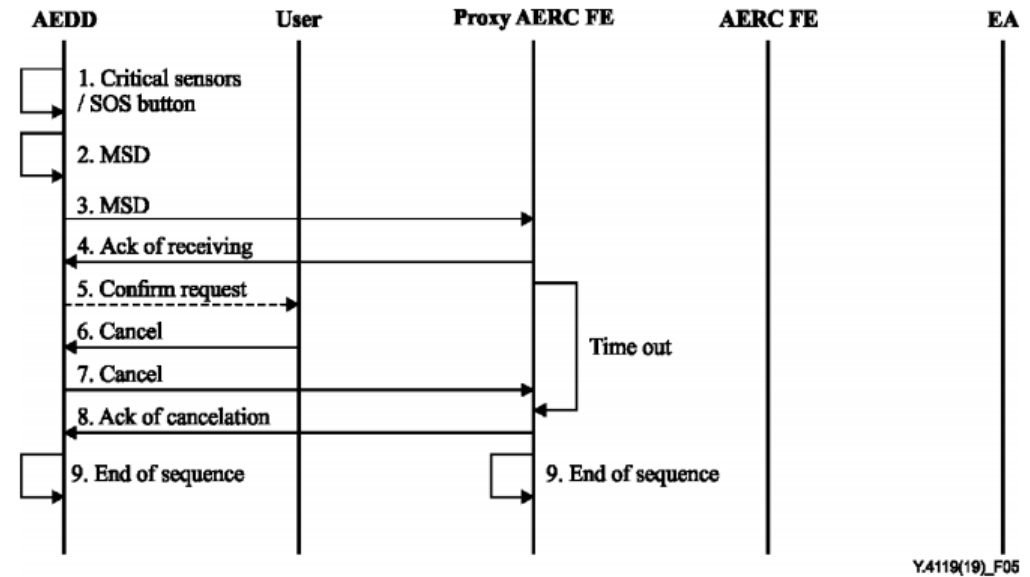
Figure 5 – AERS workflow in case of user cancellation using AEDD

Proxy AERC FE(PSAP) : Real-time location tracking support

Proxy PASP

Accident Information

Accident location tracking

- Supports accident status, callback information, and accident information detailed inquiry function based on MSD (minimum accident information) received from the terminal
- Test completed using various terminals
  Analysis of MSD information
  Determining the accuracy of the accident location
  Determining whether a callback is processed

Proxy AERC FE(PSAP) : Accident Information List

Accident Information

- Incident handling information
- accident time
- Accident location information and location movement
- Detailed inquiry of minimum accident information
- Support for storage of minimum accident information
- Support search and filter function

Proxy AERC FE(PSAP) : Detailed Accident Information

MSD 상세 정보

CBOR Encode

82019818011a5d315d32f4f4f5f412714142434445463031323334353637383930821a08058a831a1b46ed881a5d315d32821a08058a831a1b46ed881a5d315d32821a08058a831a1b46ed881a5d315d32016b30313035313130323237310 3f5f4f4f4f4f4

CBOR Decode	MSD Structure
[	{
1,	"msdVersion": 1,
[	"msdStructure": {
1,	"messageIdentifier": 1,
1563516210,	"timestamp": 1563516210,
false,	"controlType": {
false,	"automaticActivation": 0,
true,	"testCall": 0,
false,	"positionTrusted": 1,
18,	"cancelRequest": 0
"ABCDEF01234567890",	},
[	"vehicleType": 18,
134580867,	"vehicleIdentificationNumber": {
457633160	"isowmi": [
],	"A",
1563516210,	"B",
[	"C"
134580867,	],
457633160	"isovds": [
],	"D",
1563516210,	"E",
[	"F",
134580867,	"0",
457633160	"1",
	"2"

Accident Information Details

- Based on MSD standard specification (Minimum set of data structure for automotive emergency response system, Y.4467/Y.4468)
- Analysis of transmission data in CoAP data format
  - CBOR-encoded data analysis
  - CBOR decoding data analysis
  - MSD Incident Information Data Analysis

Proxy AERC FE(PSAP) : Accident Information Management

Proxy PASP
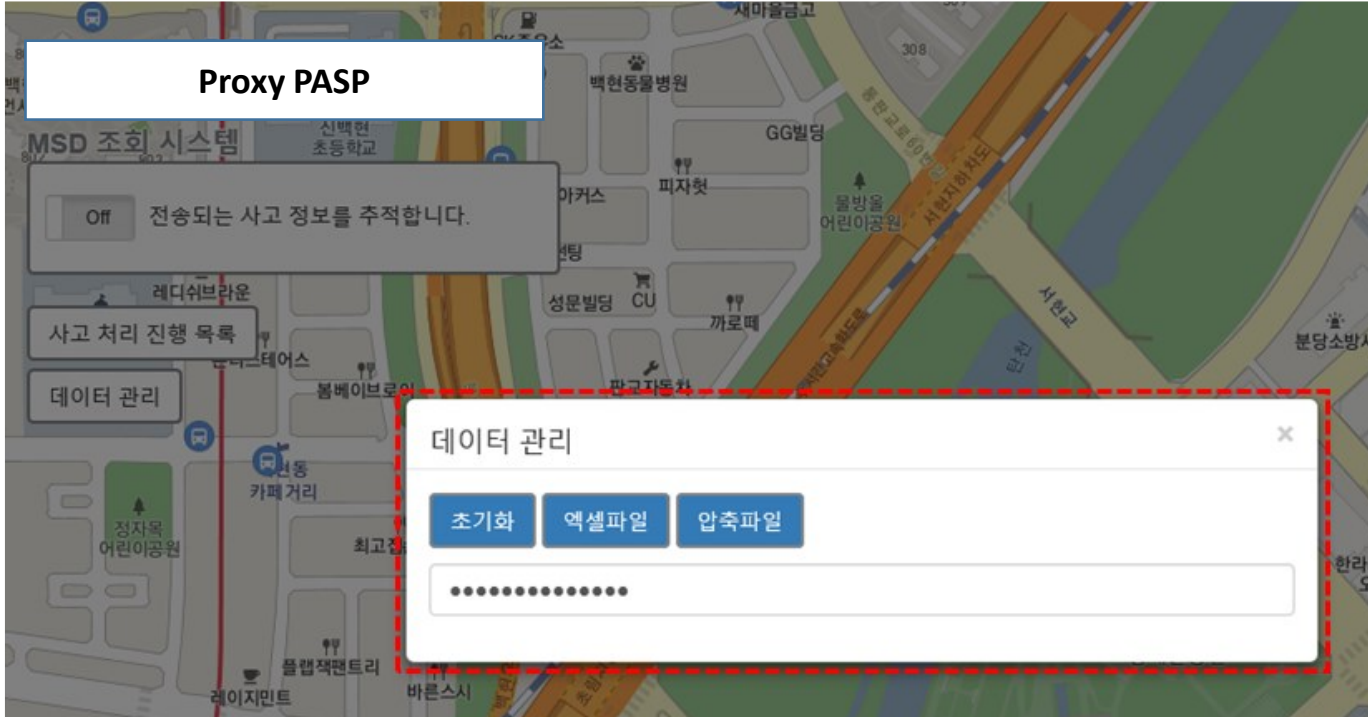
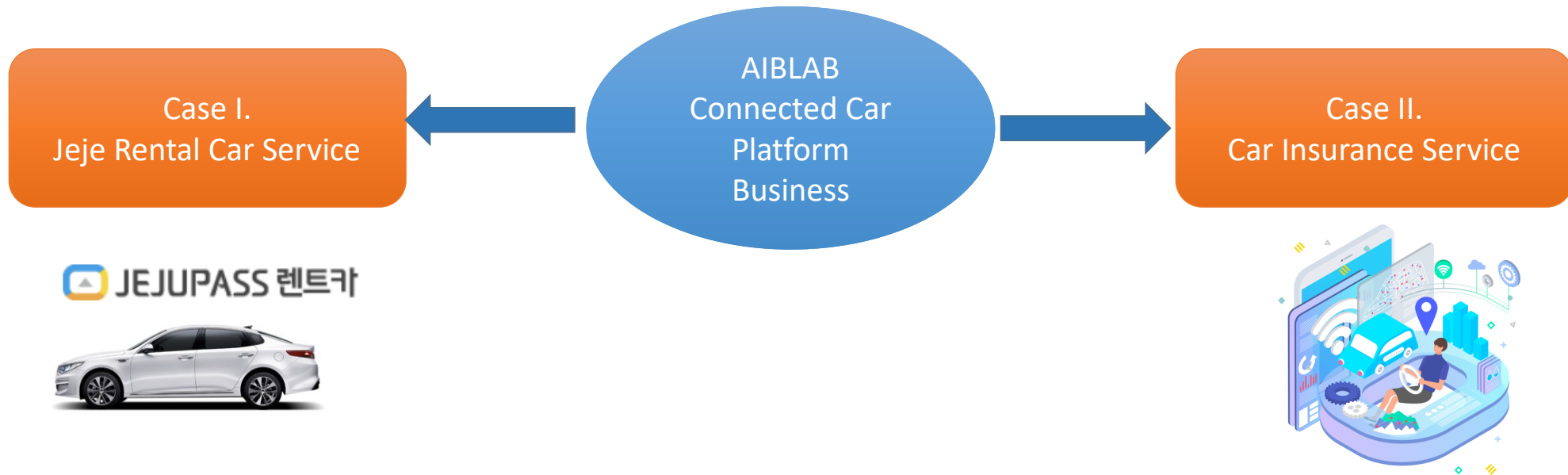## Accident Information Management Support

- Based on MSD standard specification (Minimum set of data structure for automotive emergency response system, Y.4467/Y.4468)
- MSD data storing function
- Accident information export (Excel format)
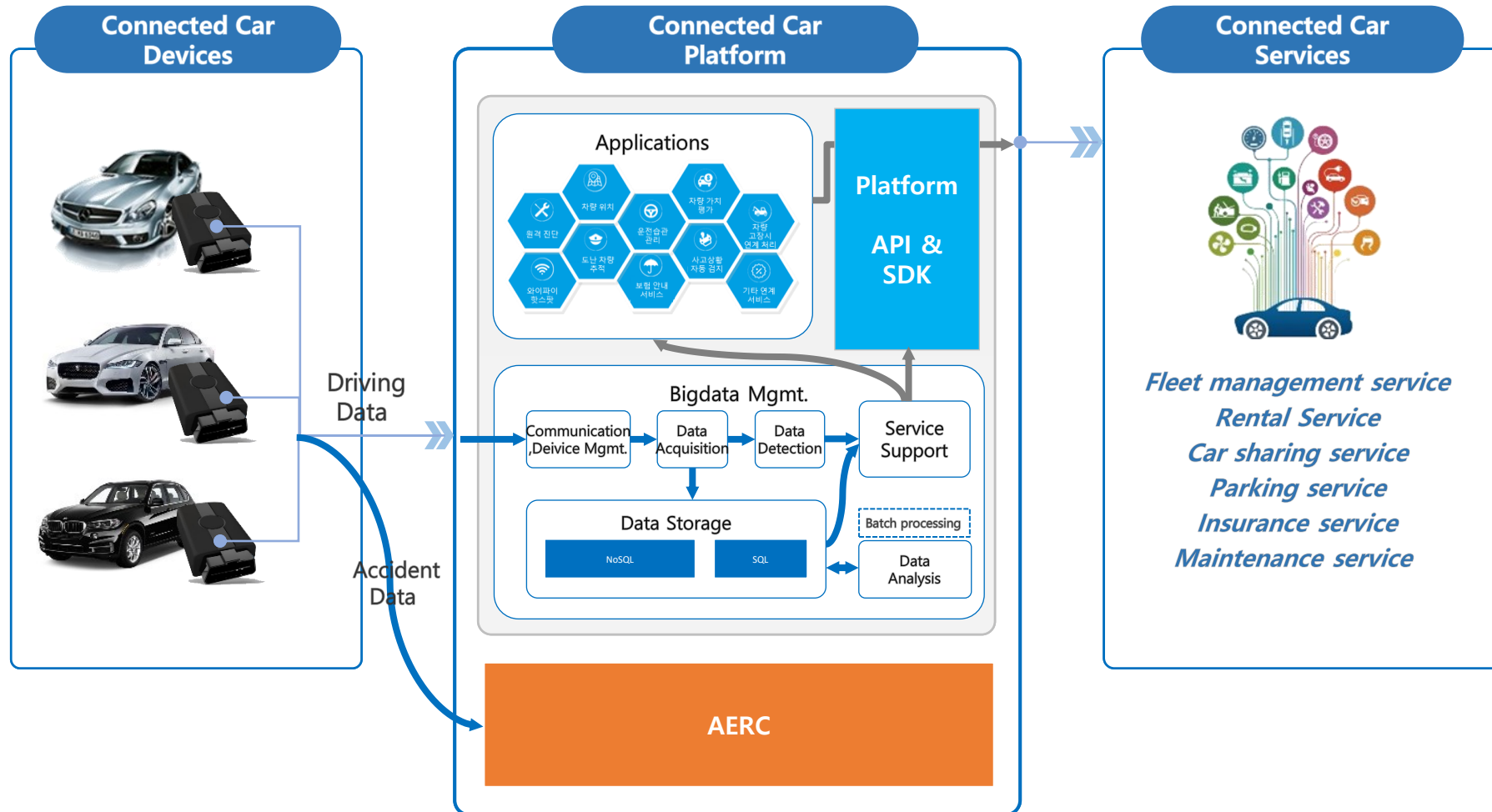- Accident information reset
- Email notification to manager

AIBLab

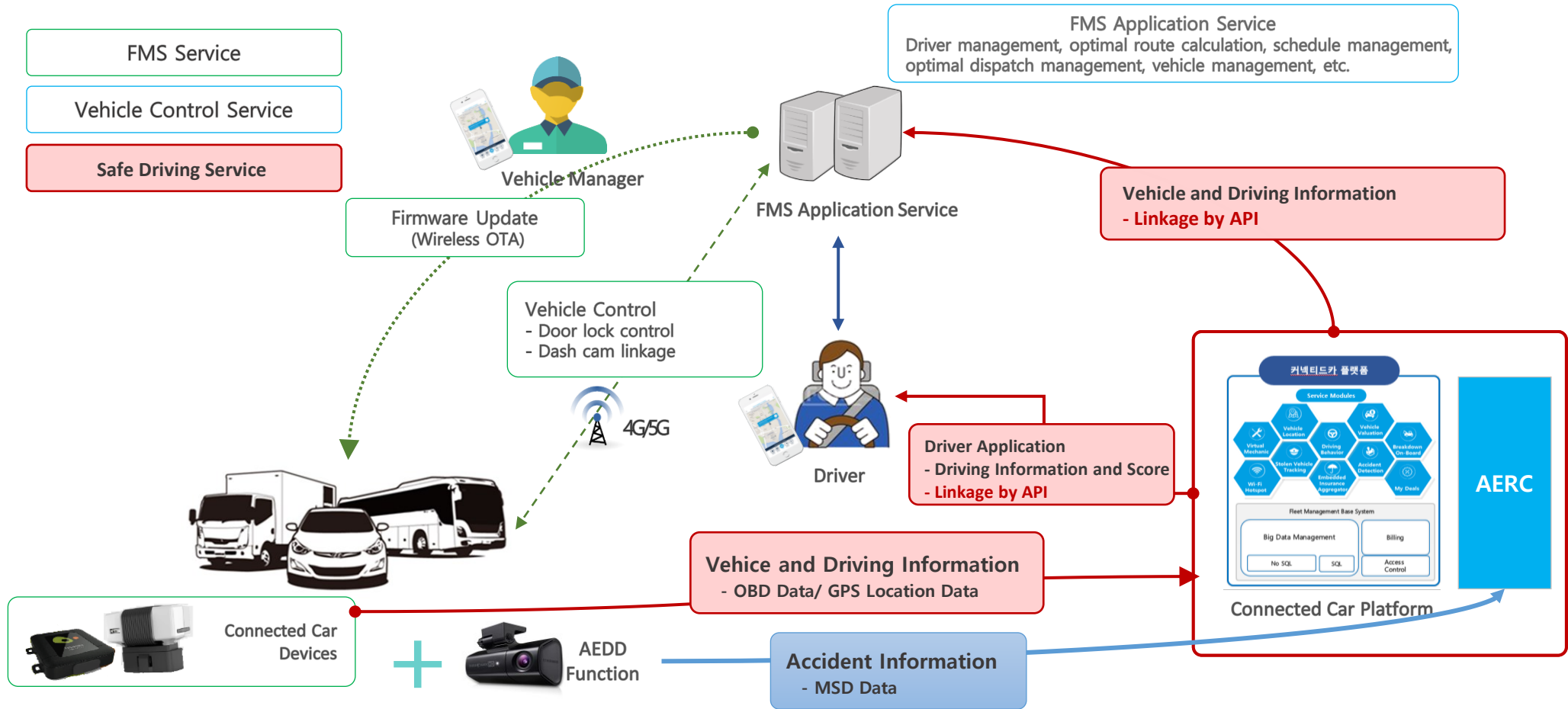# AERC Monitoring System

AIBLab

III. Business Application Cases in S. Korea

Business Applications

Case I.
Jeje Rental Car Service

AIBLAB
Connected Car
Platform
Business

Case II.
Car Insurance Service

JEJUPASS 렌트카

Possessing Core Technology and Experience for Connected Car Service

Connected Car Devices

Driving Data

Accident Data

Connected Car Platform

Applications

차량 위치 · 차량 가치 평가 · 원격 진단 · 운전습관 관리 · 차량 고장시 연계 처리 · 도난 차량 추적 · 사고상황 자동 감지 · 와이파이 핫스팟 · 보험 안내 서비스 · 기타 연계 서비스

Platform API & SDK

Bigdata Mgmt.

Communication ,Deivce Mgmt. → Data Acquisition → Data Detection → Service Support

Data Storage

NoSQL | SQL

Batch processing

Data Analysis

AERC

Connected Car Services

Fleet management service
Rental Service
Car sharing service
Parking service
Insurance service
Maintenance service

Connected Car Platform Service

FMS Service

Vehicle Control Service

Safe Driving Service

Vehicle Manager

Firmware Update
(Wireless OTA)

Vehicle Control
- Door lock control
- Dash cam linkage

4G/5G

FMS Application Service
Driver management, optimal route calculation, schedule management, optimal dispatch management, vehicle management, etc.

FMS Application Service

Vehicle and Driving Information
- Linkage by API

Driver

Driver Application
- Driving Information and Score
- Linkage by API

Vehice and Driving Information
- OBD Data/ GPS Location Data

Connected Car
Devices

+

AEDD
Function

Accident Information
- MSD Data

커넥티드카 플랫폼

Service Modules

Vehicle Location
Vehicle Valuation
Virtual Mechanic
Driving Behavior
Breakdown On-Board
Stolen Vehicle Tracking
Accident Detection
Wi-Fi Hotspot
Embedded Insurance Aggregator
My Deals

Fleet Management Base System

Big Data Management
Billing
No SQL
SQL
Access Control

AERC

Connected Car Platform

Case I. Jeju Rental Car Service

Jeju Rental Car Service

Jeju is a representative tourist destination in Korea, providing various rental car service providers. Connected car service verification through MOU with Jejupass, which has a high market share in Jeju (2019)

Eco Driving App

API **Service**

Driving

Connected Car Platform

◇ 장인수 핸디소프트 대표(사진 오른쪽)과 윤형준 제주패스 대표가 업무협약을 맺었다. [사진=핸디소프트]
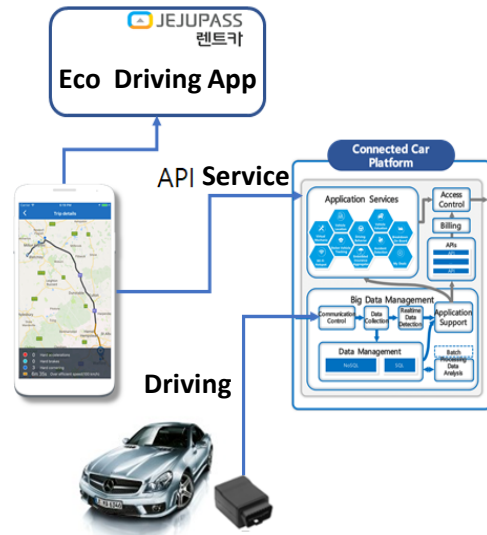
AIBLab:
Connected car platform technology and service

JEJUPASS:
Tourism information platform, rental service
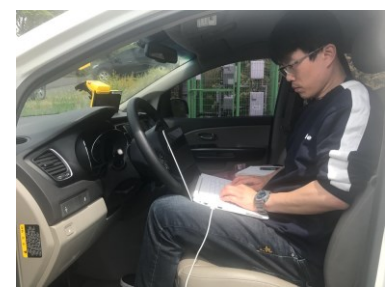
MOU and Pilot Test(2019)

Connected Car Devices

❖ 3G OBD device

CalAmp

- **Dimension :** 43 x 64 x 25 mm
- **Weight :** 52 g (including battery)
- **Certification:** FCC, CE, GCF, e-Mark, IC, PTCRB & Telco cert.
- **Program module :** Loading on flash memory, Wire/Wireless upgrade, device management by single & group
- **GPS accuracy :** 2.0 m CEP
- **Movement sensing :** 3 axis acceleration sensor
- **Data :** GPS location info, ODB data, acceleration sensing
- **Event detection :** programmable event detection, driving pattern, location, car shock

❖ 4G LTE + WiFi OBD device

DASAN Connected Car Device

- **Dimension** : 98 x 63.5 x 22 mm
- **Certification :** KC
- **Program module :** Loading on flash memory, Wire/Wireless upgrade,
- **GPS accuracy :** auto mode 2.5m CEP / SBAS mode 2.0 m CEP, external D-GPS receiver module connection
- **Movement sensing :** acceleration sensor
- **Data :** GPS location info by 1 sec, OBD data
- **Event detection :** programmable event detection, driving pattern, location, car shock
- **Etc :** Linux open platform, API support for 3rd party developer

❖ 4G LTE + WiFi OBD Device : All-in-one Connected Car Device
  ➢ OBD + LTE + GPS + WiFi + G-sensor

● Device Specification & Features
  ➢ LTE Cat 4 multi-mode (no CA)
  ➢ GPS Chip Athena built-in
  ➢ OS : Linux
  ➢ OBD Protocol : CAN,KWP2000,OBD-II
  ➢ Standard Application
    • OBD-II Standard Sensor Check
    • OBD-II Standard DTC information Check
    • FMS Server Access Support

● Option
  ➢ External DGPS Athena available
  ➢ Internal Battery(900mAh)
  ➢ 1x1 802.11 a/b/g/n/ac Wi-Fi
  ➢ BT 4.1
  ➢ G-sensor
  ➢ Voice codec

  ➢ Design reliability of All-In-One type (LTE+OBD Module+GPS)
  ➢ Quad (4) core CPU performance
  ➢ ARM Coretex A7 1.2 Ghz
  ➢ QDSP6 691 MHz (Turbo) : Modem
  ➢ Coretex M3 100 MHz : Power
  ➢ Coretex M3 48/72 MHz : OBD
  ➢ Wide OBD Protocol support K-Line : ISO 9141-2 KWP2000 : ISO 14230-4 CAN : ISO11898-2
  ➢ Linux Open Platform 3rd Party developing API support
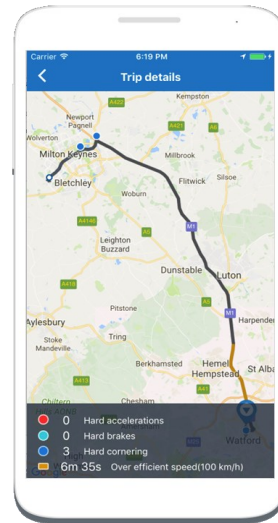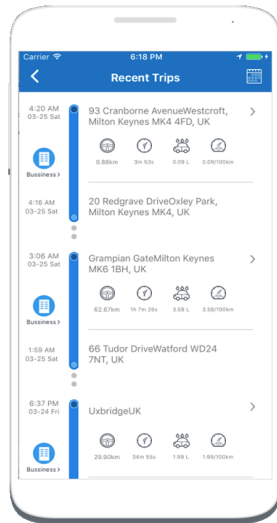 ➢ Communication Security Support 128bit Security Algorism (AS128)
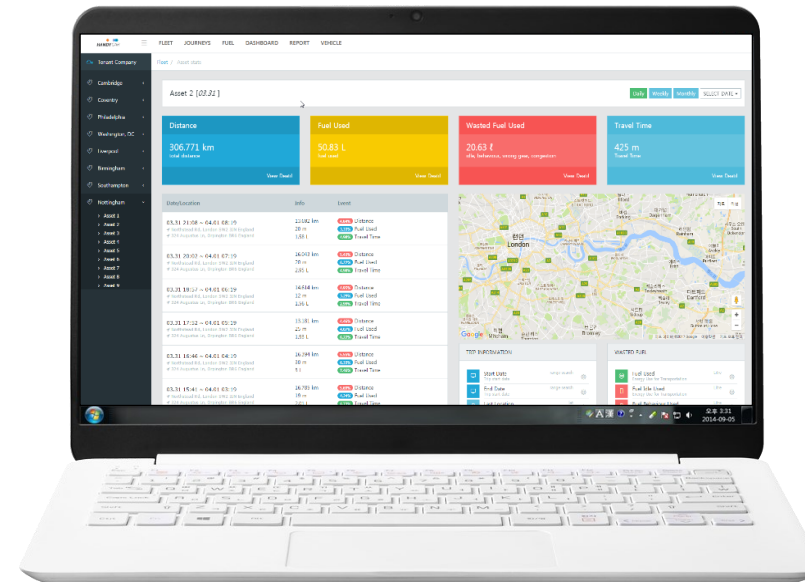
Service Applications

Driver Mobile App

- Location Service
- Safe Driving Assist

Manager Web Service

- Dashboard and Report
- Vehicle Travel Information and Summary

Service Functions

Functions

Location Service	Diagnosis Service	Safe Driving Service	Reporting Service

Location Service
- My car location
- Trip information
- Geofence

Diagnosis Service
- Diagnosis
- Diagnosis history
- Remote diagnosis, Maintenance service

Safe Driving Service
- Driving Score Service
- Ranking Service

Reporting Service
- Fuel efficiency
- Driving Distance
- Mileage

ΛlBLab

Piolet Test : Car rental device mounting and data collection/monitoring
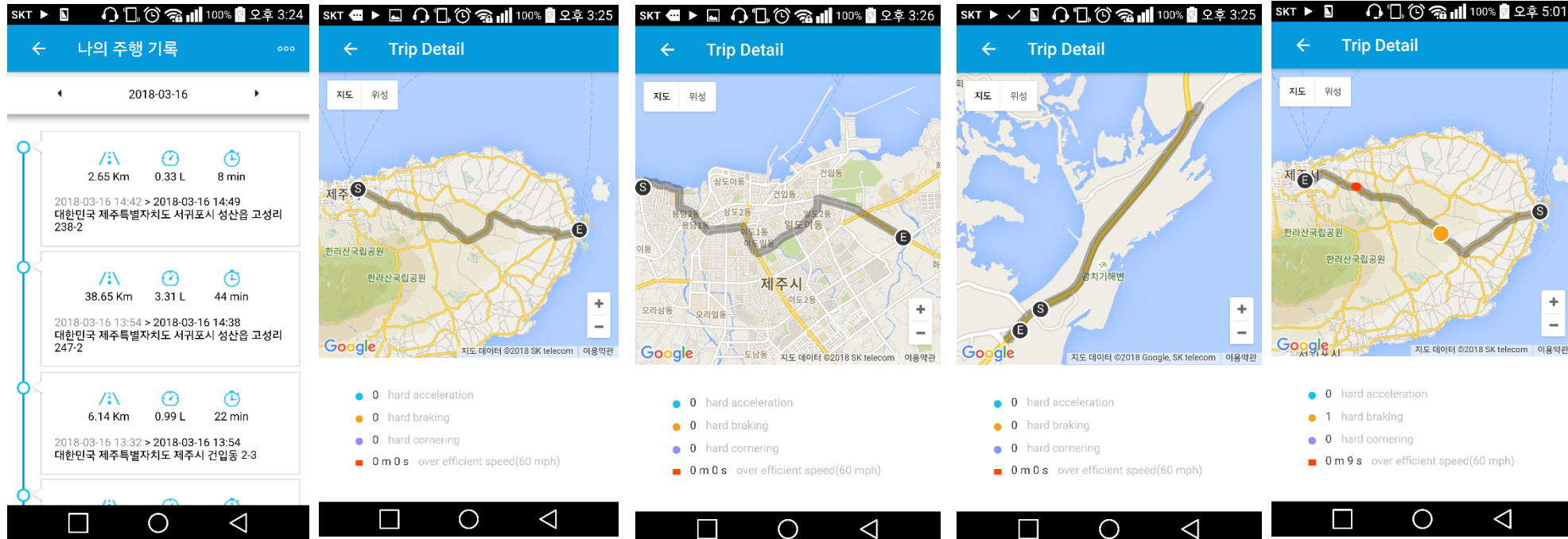
Piolet Test : Driving event testing and monitoring

Next Step: Rental car platform linkage

Eco Driving App

AREC

API Service

Connected Car Platform

Driving
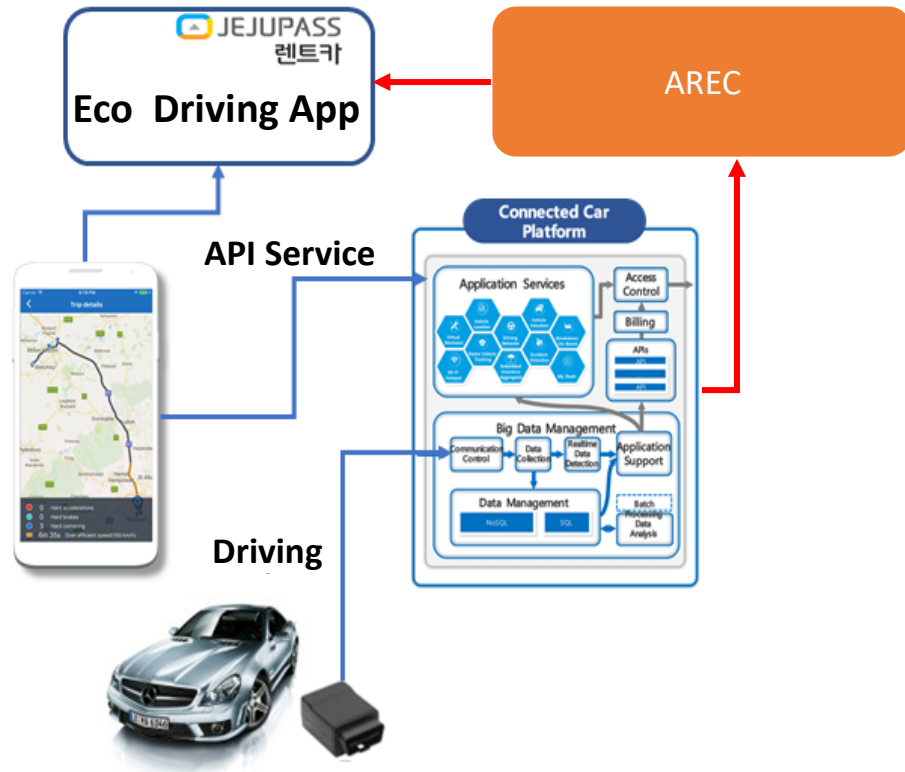
Propose to JEJUPASS

- **AREC and Connected Car platform functional linkage test**
- **Expansion of business opportunities through demonstration**

Benefits

- **Korea's first AERC and Connected Car platform connection case**
- **Support rapid and accurate emergency response by linking AERC service and rental car dispatch service**

AIBLab

Case II. Car Insurance Service

Background and Goal

Analyze safe driving habits and secure driving information
using customers' smartphones

Background
- ☑ To develop life-related products , services and to build a 'lifetime insurance platform
- ☑ Need to considering the proportion of car insurance sales and customers in the direct platform
- ☑ Securing driving habit data very related to car insurance and promoting service development

Goal

01

Realtime driving information collection

➕

02

Analysis of safe driving habits

➕

03

Driving data-based point provision

AIBLab

Strengths

1. Experience in building vehicle management/car sharing/insurance service based on connected car platform
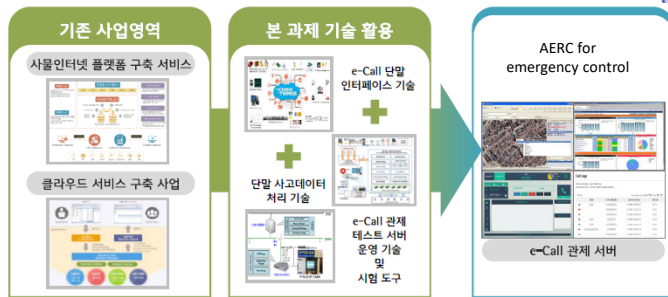### 2. Possesses mobile phone GPS/sensor data analysis technology and AERC technology
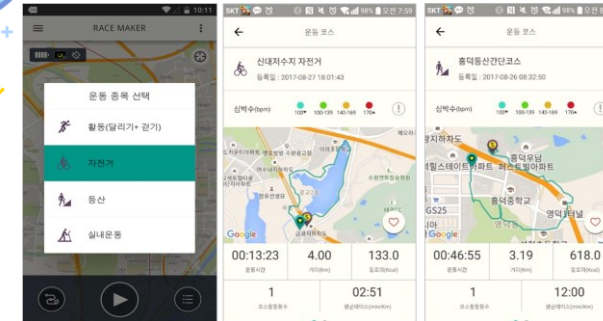
❑ Connected Car Platform

❑ Fleet Management System

S-Fire Insurance
Digital Driving Habit
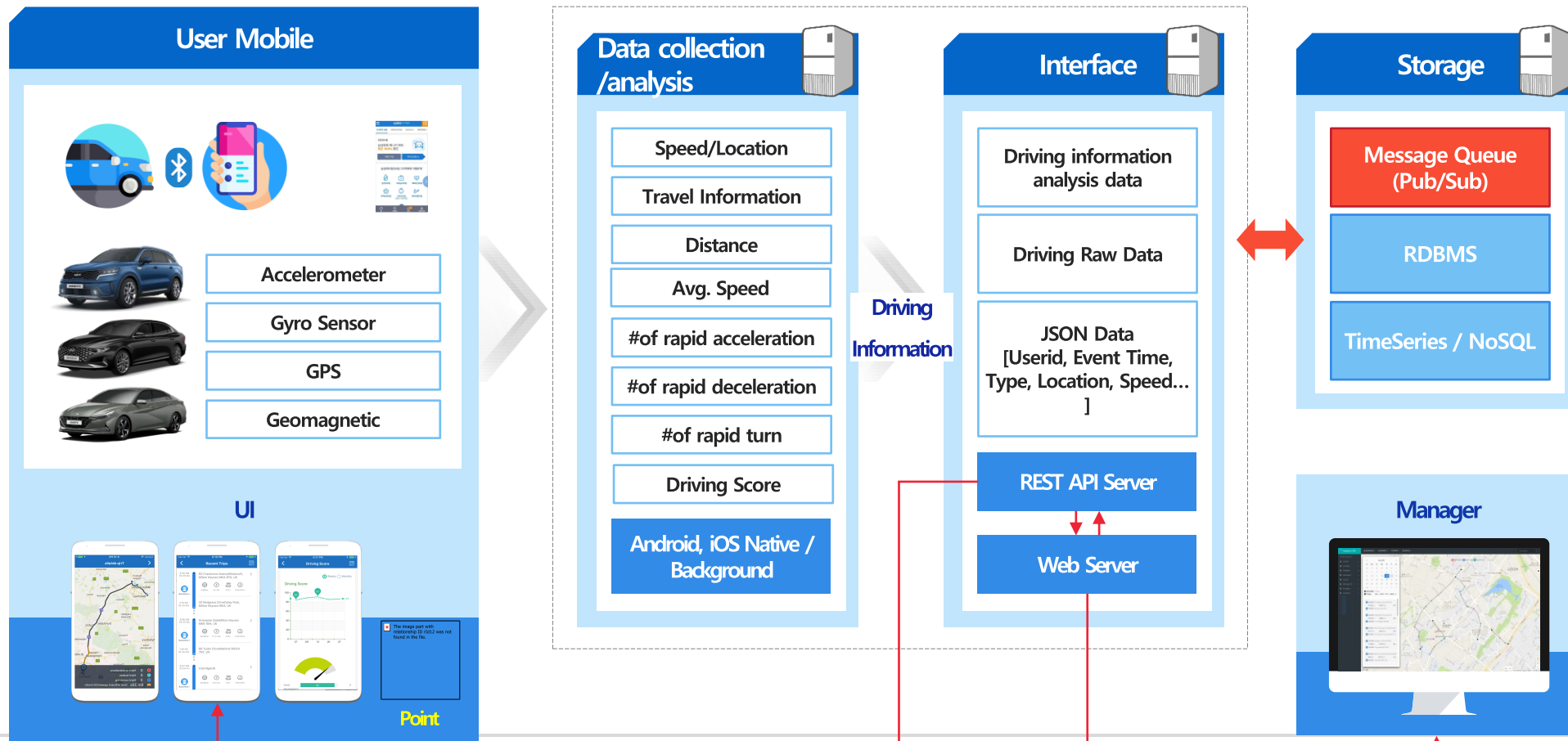Service Solution
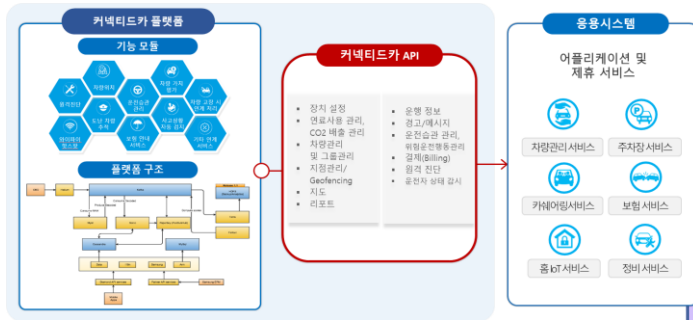
❑ AERC Serer Platform

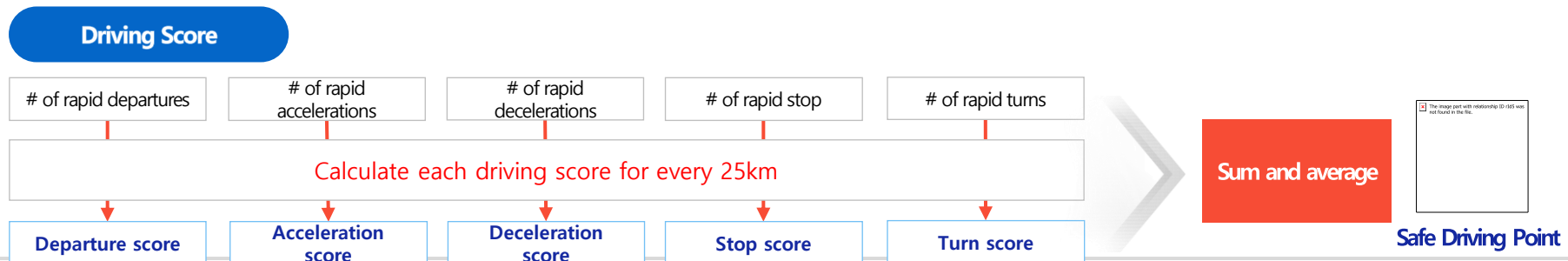❑ Racemaker map-based exercise management service

AIBLab

System Architecture

Collects location and driving information through the smartphone's GPS, 4G/5G, and sensors to monitor location information, movement route, driving habits, etc.

User Mobile

Accelerometer

Gyro Sensor

GPS

Geomagnetic

UI

Point

Data collection /analysis

Speed/Location

Travel Information

Distance

Avg. Speed

#of rapid acceleration

#of rapid deceleration

#of rapid turn

Driving Score

Android, iOS Native / Background

Driving Information

Interface

Driving information analysis data

Driving Raw Data

JSON Data [Userid, Event Time, Type, Location, Speed...]

REST API Server

Web Server

Storage

Message Queue (Pub/Sub)

RDBMS

TimeSeries / NoSQL

Manager

AIBLab

Data Connection

Location, driving log, driving distance, and dangerous driving factors using various sensors of the smartphone.
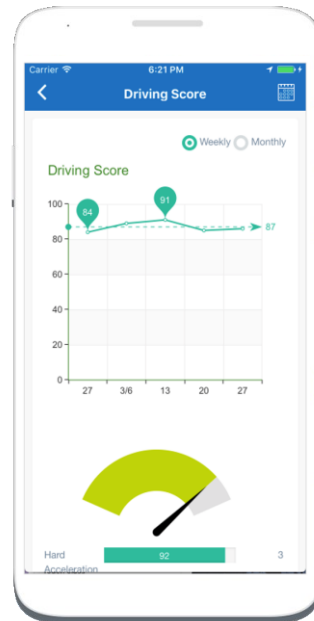
GPS Sensor

Geomagnetic sensor

Trip Payload
Data : [
      id : 1235435465654654,
      createdtime : 1528928433245,
      vehicleid : 24a354ctds3254,
      Userid : afssfkleessf,
      accel : 2,
      decel : 4 ,
      corner : 3,
      distance : 14324,
      trips : [
            { eventtime : 1528928433245,
            lat : 38.32565,
            lng : 127.107777 },
             { eventtime : 1528928433245,
            lat : 38.32565,
            lng : 127.107777 },
      ]
    ]

Gyro sensor

Accelerometer

Interfaces

Driving information analysis data

Driving Raw Data

JSON Data
[
Userid, Event Time, Type, Location, Speed
…
]

REST API Server

Driving Score

# of rapid departures	# of rapid accelerations	# of rapid decelerations	# of rapid stop	# of rapid turns

Calculate each driving score for every 25km

Departure score	Acceleration score	Deceleration score	Stop score	Turn score

Sum and average

Safe Driving Point

⅄IB Lab

User Application

App UI express the driving Score and driving Information

Driving Score

Driving Information(History)
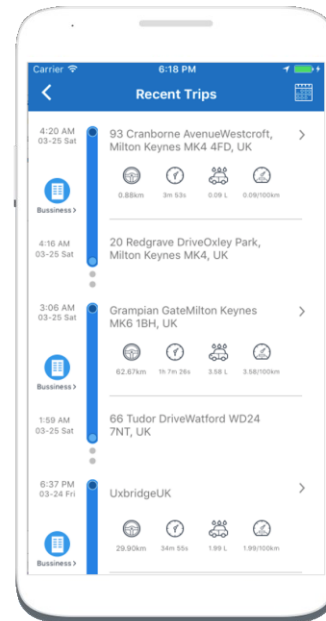
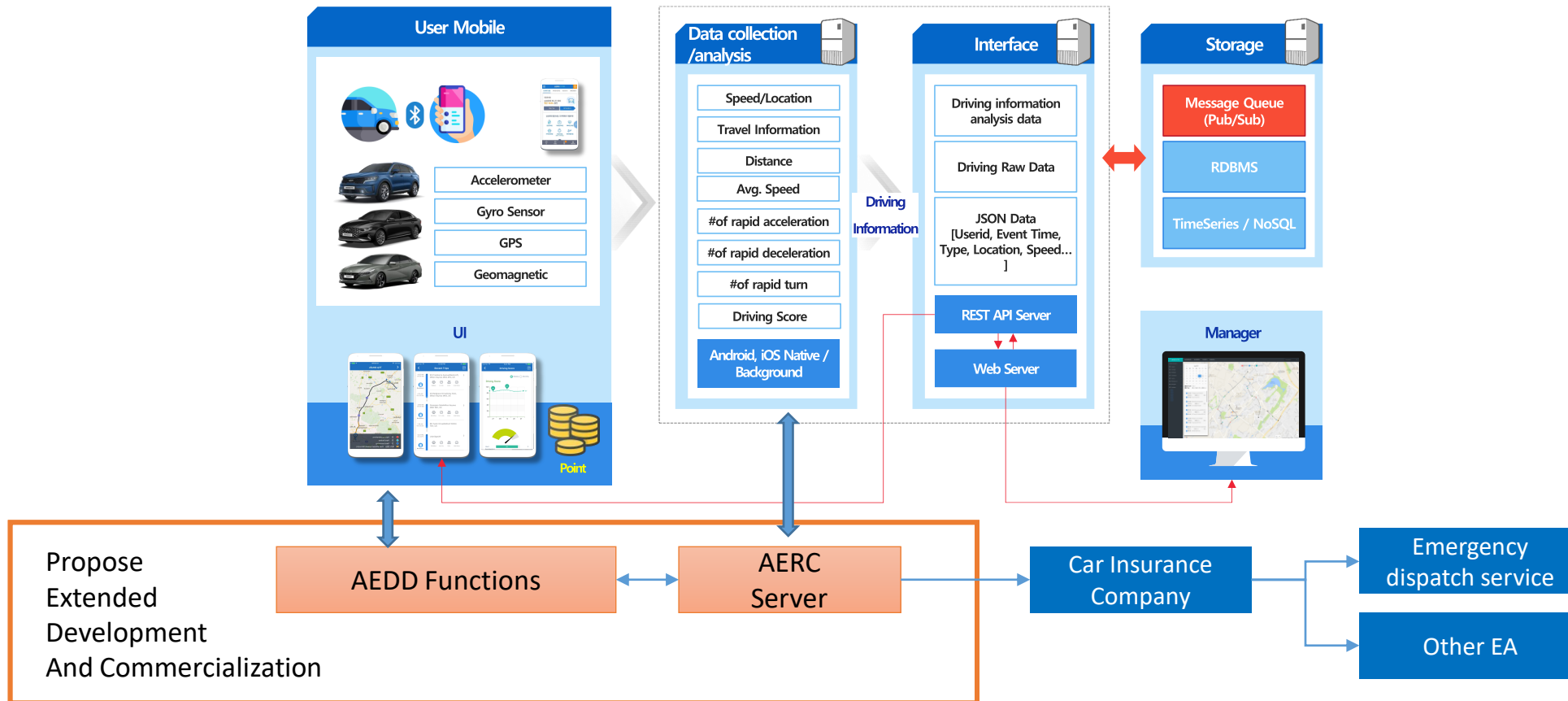**Driving Information(Travel)**
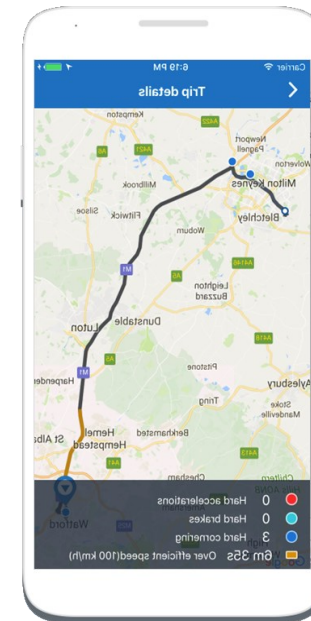
AIBLab

Benefits

Enhance customer satisfaction by analyzing smartphone-based safe driving habits and providing points accordingly

Improve customer service	Provide data driven service	Acquisition of driving information	Improvement in accidents	Securing technical competency	365 days non-stop service
Provide points based on driving habit information	Securing data-based service capabilities	Real-time driving information of insurant	Improvement of safe driving compensation system	Securing real-time data collection and analysis technology capabilities	Increased availability due to system stabilization

Future directions

✓ Various additional services based on the insurant's driving information

✓ Improve customer satisfaction by applying AI analysis services based on accumulated data

✓ Improve emergence service by applying AERC system
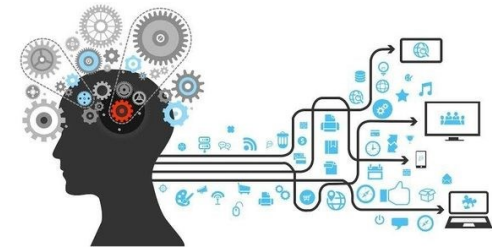
AIBLab

Thank You

Start with AIBLab AI & IoT Platform!

AIBLab